

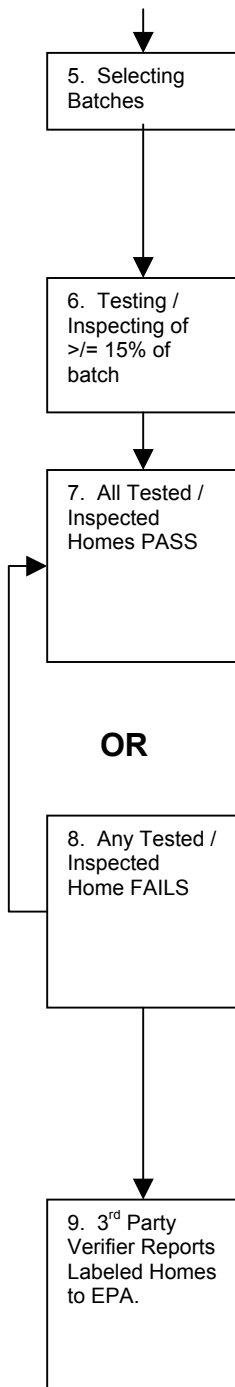
ENERGY STAR[®] FOR HOMES

Sampling Protocol Guidelines



These Guidelines provide the specifications for using sampling in verifying homes meet the ENERGY STAR criteria. Two sets of guidelines are given: required procedures and best practices. While the required procedures must be followed, the best practices are given to help users successfully implement the Sampling Protocol.

Phase of Implementation	Required Procedures	Best Practice
<div data-bbox="207 590 402 667">1. Builder Qualification</div> <div data-bbox="170 722 440 932">2. Select the initial subdivision and the energy efficient measures needed to meet ENERGY STAR.</div> <div data-bbox="207 1297 402 1409">3. Builder builds first home</div> <div data-bbox="207 1640 402 1717">4. Initial Testing</div>	<ul style="list-style-type: none"> Builder signs EPA Partnership Agreement to become an ENERGY STAR Partner. To be eligible for sampling the builder must build a minimum of 85 homes per year. Builder selects an initial subdivision and contacts a 3rd party verifier (from Locator Map on www.energystar.gov/homes.) 3rd party verifier identifies energy efficient measures (options) needed to meet or exceed Energy Star based on <ul style="list-style-type: none"> HERS rating of individual plans for each model in the subdivision, or EPA-approved Builder Options Packages (BOPs). If custom HERS analyses are used to select energy measures, plan reviews must be based on a worst case configuration (e.g., worst orientation, all options that increase window area, and should consider options like extended family rooms, sunrooms, etc.) Builder selects energy efficient measures based on 3rd party verifier recommendations. This is the first of three homes that will be fully tested and inspected before the sampling protocol can be initiated. 3rd party verifier performs full testing and inspecting of the first 3 homes built within the first subdivision. This is required for only the first subdivision. If any home fails to meet specifications, the initial testing phase will continue until 3 consecutive homes pass. 	<ul style="list-style-type: none"> Builder demonstrates consistency in their specifications and production processes. 3rd party verifier performs diagnostics on an existing model home to get a baseline for current air infiltration and duct leakage. This enables the 3rd party to identify the improvement needed in these areas. Builder should select one set of energy efficient measures for all plans if possible. 3rd party verifier works with the builder and their sub-contractors, especially the HVAC contractor to identify any changes required, and trains them on the verification / inspection process. <ul style="list-style-type: none"> Air sealing and duct sealing should be a strong focus. Repeat with every new subdivision, or if the builder changes subcontractors. This training should also be repeated for new crews and on a periodic (e.g., annual) basis. 3rd party verifier should select different models for initial testing. Recommend repeating Initial Testing step for new subdivisions, especially if there is a change in sub-contractors. If any of the three homes fail, particularly regarding the performance of sub-contractors on air sealing and duct sealing, an extended phase in period should be considered where every home is tested until there is consistency in the house and duct tightness of the homes



- Builder identifies a batch of homes. A "Batch" is a group of homes ready for diagnostics (i.e., drywall complete, interior door jams installed, HVAC system installed, and final air sealing completed.) These homes are likely to be concurrently under construction within a block of time (e.g., month).

- 3rd party verifier randomly selects at least 15% of homes from a batch for testing and inspecting.
- Depending on the verification method, testing and inspecting includes performing a full HERS rating or a full BOP inspection.

- If each of the tested homes within the batch PASSES then all homes with the batch PASS.
- 3rd party verifier will keep a record of every home within the batch – both tested and not.
- 3rd party verifier will report to EPA on a quarterly basis the number of homes receiving full inspections and the remaining number of homes that were not inspected.

- If any rated home within the identified batch fails, the entire batch fails. The root-cause of the failure must be assessed and fixed in every home in the batch.
- Each home must receive full testing and inspecting to be labeled ENERGY STAR.

- 3rd party verifier will keep a record of every home within the batch – both tested and not.
- 3rd party verifier or their provider will report to EPA on a quarterly basis the number of homes receiving full inspections and the remaining number of homes that were not inspected.

- The builder and 3rd party verifier should keep the batch sizes small to catch mistakes faster and enable the builder to quickly correct any systemic problems that may be found. (Any batch with even one failure must have the entire batch tested.)

- When selecting the homes from an available batch for testing and inspecting, the 3rd party verifier should select different models to ensure an effective sample.

- 3rd party should address any minor problems that may have been found during testing / inspecting by facilitating root-cause analysis and remediation with the builder and / or subcontractors.

- During the testing and inspecting of each home in the failed batch, assess whether or not the problem is an isolated failure.
- Notify the builder and / or subcontractors to ensure the cause of the failure will be corrected in the tested home, each home within the failed batch, and in all future homes.
- In general, keeping batch size small will help avoid a failure from being widespread.
- After a failure has been found, the sampling rate should be increased before resuming normal sampling procedures.